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THE NEW ENGLAND BOTANICAL CLUB

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NOTES ON CRATAEGUS IN THE CHAMPLAIN VALLEY.

C. S. SARGENT.

THE following notes are based on collections accompanied by copious field notes made during the past two seasons by Mr. Ezra Brainerd principally in the neighborhood of Middlebury, Vermont, and by Mr. W. W. Eggleston near Rutland and Bennington, Vermont. They are supplemented by small collections made by Mr. A. W. Edson and Professor L. R. Jones near Burlington during 1899 and 1900, and by a number of specimens collected near Charlotte by Mr. C. G. Pringle and Mr. F. H. Horsford at different times during the last twenty-five years. Examination of this material shows that the Champlain valley is one of the richest regions in the world in forms of Crataegus and that the comparatively small part of the state of Vermont, extending from Burlington on the north to Bennington on the south and from the shores of Lake Champlain to the foot of the Green Mountains, contains more forms of the genus than botanists recognized only a few years ago on the entire continent of North America. Rich as are the collections of Crataegus which have lately been made in southwestern Vermont they probably do not exhaust the field and a few additions to the following list of Vermont species will probably be necessary after another season of field work.

CRUS-GALLI.

CRATAEGUS CRUS-GALLI, L. Rare and local. VERMONT, Ferrisburg, *F. H. Horsford*, June, 1899; Orwell, *W. W. Eggleston*, September, 1899; Chimney Point, *E. Brainerd*, September, 1899; Thomson's Point, near Charlotte, *C. S. Sargent*, September, 1900: NEW YORK, Crown Point, *W. W. Eggleston*, September, 1899.

PUNCTATAE.

C. PUNCTATA, Jacquin. The common species, often attaining a large size.

MOLLES.

C. Champlainensis. Leaves ovate, acute, rounded, truncate, somewhat cordate or cuneate at the base, usually slightly divided into two or three pairs of narrow acute lobes, coarsely and sharply serrate often to the base with gland-tipped teeth, at the flowering time roughened above by short pale hairs and villose-pubescent below, at maturity thick and firm, bluish green and glabrous on the upper surface, yellow-green, and slightly pubescent on the lower surface of the slender midribs and remote primary veins, from 2 to 2½ in. long, from 1 to 1½ in. wide; petioles deeply grooved on the upper side, slender, from ¾ to 1 in. in length, tomentose or often nearly glabrous, dull red below the middle. Flowers in compact few-flowered villose corymbs; bracts and bractlets lanceolate to oblanceolate, coarsely glandular-serrate, caducous; calyx densely tomentose, the lobes lanceolate, closely glandular-serrate, villose usually only below the middle, reflexed after anthesis; stamens 10; filaments slender; anthers light yellow; styles 5, surrounded by tufts of pale hairs. Fruit short-stalked in compact erect tomentose clusters, obovate to oblong, bright scarlet, marked with scattered pale lenticels, more or less tomentose at the ends, from ½ to ⅝ in. in length, ½ in. in width; calyx prominent, long-tubed, persistent, the lobes erect or spreading, tomentose, glandular-serrate; flesh thick, yellow, dry and mealy; nutlets 5, $\frac{5}{16}$ in. long, broadly ridged on the back.

A tree from fifteen to twenty feet in height with a well-developed trunk eight or ten inches in diameter covered with red-brown scaly bark, stout wide-spreading branches often forming a symmetrical round-topped head, and slightly zigzag branchlets marked with large oblong white lenticles, tomentose at first, becoming light chestnut-brown during the first summer and ashy gray during their second year, and armed with slender straight or slightly curved bright chestnut-brown spines from 1½ to 2 in. long. Flowers during the first week in June. Fruit ripens toward the end of September but remains on the branches until the New Year.

VERMONT, Middlebury, *E. Brainerd*, June and September, 1900: NEW YORK, Crown Point, *Brainerd & Sargent*, September, 1900: Province of QUEBEC, Chateaugay, Adirondack Junction, Caughnawaga, *J. G. Jack*, 1899, 1900.

C. Champlainensis has been probably often confounded with *C. mollis* of Scheele of the central west, from which it is distinguished

by its smaller flowers with 10 not 20 stamens, smaller and less tomentose leaves, and by its smaller oblong or pear-shaped fruits, which usually do not fall until winter.

C. Pringlei. Leaves oval, pointed, rounded and often abruptly contracted at the base into the slender petioles, or on vigorous shoots truncate or slightly cordate at the base, sometimes irregularly lobed with short broad acute lobes, coarsely and often doubly serrate with gland-tipped teeth, at the flowering time roughened above with short closely appressed pale hairs, glabrous below with the exception of a few pale hairs along the slender midribs and remote primary veins, at maturity thin, glabrous and bright yellow-green on the upper surface, paler on the lower surface, from 2 to 2½ in. long and from 1¾ to 2¼ in. wide, or on vigorous shoots often 3 in. long and wide; petioles from 1 to 1¾ in. long, deeply grooved, at first villose or tomentose, more or less glandular with scattered dark glands, finally often nearly glabrous. Flowers from ¾ to 1 in. diameter, in many-flowered tomentose corymbs; calyx broad, tomentose, the lobes lanceolate, coarsely glandular-serrate, hirsute on the upper surface; stamens 10; filaments slender; anthers small, yellow; styles 3 to 5, surrounded at the base by conspicuous tufts of pale tomentum. Fruit oblong, dark dull red, villose at the ends with long scattered pale hairs, marked by a few large pale lenticels, ¾ in. long, about ⅝ in. thick; calyx cavity deep and narrow, the lobes nearly triangular, tomentose, pale, erect, often deciduous; flesh yellow, thick, dry and mealy, acid, with a disagreeable flavor; nutlets 5, pale, ⅓ in. long, rounded and slightly ridged on the back.

A tree from 20 to 25 feet in height with a well-formed trunk covered with dark red-brown scaly bark, stout branches forming a wide symmetrical head, or often of shrubby habit with numerous erect stems, and slightly zigzag branchlets marked with oblong pale lenticels, at first dark green and tomentose, becoming chestnut-brown and very lustrous during their first season, bright orange-brown during their second year and ashy gray during their third season, and armed with stout straight or slightly curved chestnut-brown spines often 1½ in. long. Flowers open during the last week of May. Fruit ripens at the end of September or early in October and soon falls.

Common in the Champlain Valley at least as far north as Charlotte, Vermont, where it appears to have been first collected in May, 1877, by *C. G. Pringle*; Crown Point, New York, October, 1899, and Bald Mountain, Shrewsbury, Vermont, *W. W. Eggleston*, May, 1900; Middlebury, Vermont, and Crown Point, New York, *E. Brainerd*, September, 1900; Guild, New Hampshire, *B. L. Robinson*, September, 1899, (No. 672); Rochester, New York, *C. S. Sargent*, September, 1900; near Toronto, Canada, *D. W. Beadle*, September, 1899; Lansing, Michigan, *C. F. Wheeler*, September, 1898; near Barrington, Illinois, *E. J. Hill*, September, 1899.

This species, which has been confounded with *C. tomentosa*, Lin-

naeus, and with *C. mollis*, Scheele, can always be readily distinguished by its thin drooping oval leaves which, except on vigorous shoots, are frequently convex by the gradual infolding of the blades from the midribs to the margins.

FLABELLATAE.

C. lobulata. Leaves oval to oblong-ovate, acute, cuneate or rounded at the entire base, deeply divided above into numerous narrow acute lobes, sharply and often doubly serrate with spreading glandular teeth, coated above until after the opening of the flowers with short soft pale hairs and slightly puberulous below on the slender midribs and thin arching primary veins, at maturity membranaceous, dark yellow-green and glabrous on the upper surface, paler and slightly villose below toward the base of the midribs with occasional short pale hairs, from 2½ to 3½ in. long and from 2 to 2½ in. wide; petioles slender, nearly terete, sometimes glandular on vigorous shoots, coated at first with short matted tomentum, ultimately slightly villose or nearly glabrous, bright red, from 1 to 1½ in. long. Flowers ¾ in. in diameter, in rather compact thin-branched tomentose compound cymes; bracts and bractlets linear-lanceolate, glandular-serrate, bright red; calyx narrow, dark red, glabrous or villose toward the base, the lobes linear, acuminate, glandular-serrate with stipitate red glands, glabrous; stamens 10; filaments slender; anthers small; styles 3 to 5. Fruit in compact erect slightly tomentose clusters, oblong, somewhat flattened at the full and rounded ends, bright crimson, lustrous, marked by occasional small white lenticels, about ¾ in. long and ⅝ in. thick; calyx cavity deep and narrow, the lobes small, lanceolate, coarsely glandular-serrate, tomentose on the upper surface, erect and incurved, persistent; flesh thick, yellow, sweet and juicy; nutlets 3 to 5, thin, dark-colored, ridged and often grooved on the back, ¼ in. long.

A tree occasionally 35 feet in height with a tall trunk often a foot in diameter covered with dark red-brown scaly bark, stout usually ascending branches forming an open irregular head, and slender branchlets at first dark green and tomentose, becoming bright chestnut-brown and lustrous during their first season and light orange-brown during their second year, and sparingly armed with short stout chestnut-brown spines rarely more than an inch in length. Flowers during the last week of May. Fruit ripens and falls early in October.

VERMONT, Middlebury, *E. Brainerd*, May and September, 1900; Charlotte, *F. H. Horsford*, August, 1900; near Burlington, *L. R. Jones*, October, 1899: NEW YORK, Crown Point, *E. Brainerd*, September, 1899, *E. Brainerd & C. S. Sargent*, September, 1900.

Well distinguished from the related *C. Holmesiana* by its more deeply divided and greener leaves, by its tomentose cymes, larger flowers, more numerous stamens, and by its late-ripening fruit.

C. HOLMESIANA, Ashe, Jour. Elisha Mitchell Sci. Soc. xvi. pt. ii. 78 (1890). Sargent, Bot. Gazette, xxxi. 10. VERMONT, Charlotte, *F. H. Horsford*, May and September, 1899; North Pownal and Fairhaven, *W. W. Eggleston*, September, 1899; Bennington and West Rutland, *W. W. Eggleston*, May, 1900; Ferrisburg, *E. Brainerd*, September, 1899; Weybridge, *E. Brainerd*, May and September, 1900.

TENUIFOLIAE.

C. acutiloba. Leaves ovate, acute, rounded or wedge-shaped at the base, laciniately cut into four or five pairs of acute or acuminate narrow lobes, their tips entire, spreading, and often more or less curved downward, sharply glandular-serrate with incurved teeth, bronze red as they unfold and coated on the upper surface with soft pale appressed hairs, at maturity membranaceous, glabrous, dark yellow-green above, paler below, 2 to 3 in. long and ½ to 2 in. wide, with slender midribs and veins running to the tips of the lobes; petioles slender, nearly terete, glandular with minute dark glands, often dark red, from 1 to 1½ in. in length. Flowers ¾ in. in diameter in broad loose many-flowered thin-branched glabrous cymes; bracts and bractlets linear-lanceolate to oblanceolate, coarsely glandular-serrate, light red; calyx narrowly obconic, glabrous, the lobes linear-lanceolate, long-pointed, entire, tipped with bright red glands, reflexed after anthesis; stamens usually 10; filaments slender, elongated; anthers small, rose-color; styles 3 or 4, surrounded at the base by a thin ring of pale tomentum. Fruit in loose large pendulous clusters, oblong or obovate, bright scarlet, very lustrous, about ½ in. long and ⅓ in. thick; calyx cavity deep and narrow, the lobes elongated, reflexed and closely appressed, usually persistent; flesh thin, dry and mealy; nutlets usually 2 or 3, prominently ridged on the back, ¼ in. long.

A broad shrub often 10 or 12 feet high with many stout intricately branched stems and slender chestnut or orange-brown lustrous branchlets marked with pale lenticels, becoming ashy gray during their second season, sometimes nearly unarmed but usually furnished with stout straight or slightly curved spines from 1 to 2 in. in length. Flowers at the end of May. Fruit ripens after the middle of September and remains on the branches for several weeks, falling gradually.

The common thin-leaved species of the Atlantic coast from Massachusetts Bay to Nova Scotia and not rare in northern New Hampshire, in the Champlain Valley and in the neighborhood of Montreal. Well distinguished from the other thin-leaved species, with 10 stamens and rose-colored or pink anthers, by the sharp usually deep lobing of the leaves. This plant is cultivated in England as *Crataegus coccinea indentata*, Loudon, but Loudon's figure of his variety of

that name (Arb. Brit. ii. 817, f. 566), which cannot be satisfactorily determined, certainly represents another plant.

C. matura. Leaves oval or rhomboidal to ovate-oblong, acute or acuminate, cuneate or on vigorous shoots often rounded at the broad base, incisely divided into numerous short acute spreading lobes, finely doubly serrate often nearly to the very base with glandular incurved teeth, covered on the upper surface while young with short soft fine hairs and at maturity membranaceous, glabrous, dark rich green above, paler and yellow-green below, from 2 to 3 in. long and from 1½ to 2 in. wide, with thin midribs slightly impressed above and slender primary veins arching to the points of the lobes; petioles slender, nearly terete, often slightly winged above on vigorous shoots, glandular, from 1 to 1½ in. in length. Flowers in broad many-flowered slender branched cymes; calyx cup-shaped, glabrous, the lobes lanceolate, acute, slightly and irregularly glandular-serrate or entire, villose on the upper surface, reflexed after anthesis; stamens 20; filaments slender, elongated; anthers minute; styles 5. Fruit in erect or drooping clusters; oblong, full and rounded at the ends, ¾ in. long, ½ in. thick, lustrous, dark purplish crimson when fully ripe; calyx cavity deep and narrow, the lobes small, slightly glandular-serrate or entire, villose above, prominently ribbed below, usually erect, persistent; flesh thick, yellow, soft and pulpy; nutlets 5, thin, dark-colored, rounded and ridged on the back with high thick ridges, ¼ in. long.

A shrub from 6 to 10 feet high with slender stems and glabrous lustrous orange-brown branchlets becoming ashy gray during their second season, and armed with few usually straight spines from 1 to 2 in. in length.

Rocky hillsides, common. Flowers at the end of May. Fruit begins to ripen by the middle of August and usually has entirely disappeared before the 10th of September.

Vermont, Hotel pasture, Burlington, *A. W. Edson*, May, 1900; Weybridge, Bristol and Middlebury, *E. Brainerd*, August and September, 1900; Middlebury, *C. S. Sargent*, September, 1900; Massachusetts, West Boylston, *J. G. Jack*, September, 1899, and *C. S. Sargent*, September, 1900.

Well distinguished from the other species of this group by its 20 stamens and by the early ripening of the fruit, which probably matures earlier than that of any other New England species.

C. pastorum. Glabrous with the exception of a few scattered pale hairs on the upper surface of the unfolding leaves. Leaves ovate, acute, full and rounded or occasionally cuneate or on vigorous shoots cordate at the broad base, slightly divided above the middle into short broad acute lobes, doubly serrate with usually straight teeth tipped with dark red glands, bronze red as they unfold, at maturity thick and firm in texture, dark dull blue-green on the upper surface, pale and often glaucous on the lower surface, 1½ to

2 in. long and 1¼ to 2 in. wide, with midribs deeply impressed above and few slender primary veins; petioles very slender, nearly terete, 1 to 1¼ in. in length, sometimes glandular on leading shoots. Flowers ¾ in. in diameter on short stout pedicels, in compact many-flowered corymbs; bracts and bractlets lanceolate, conspicuously glandular-serrate, bright red, caducous; calyx broadly obconic, the lobes lanceolate from broad bases, entire or obscurely glandular-serrate, tipped with conspicuous bright red glands, reflexed after anthesis; stamens usually 10, sometimes 5 to 10, rarely 20; filaments slender, elongated; anthers small, rose-purple; styles 2 to 5, usually 2 or 3. Fruit in loose drooping clusters, oblong, bright scarlet, lustrous, marked with large pale scattered lenticels, about ½ in. long and ⅜ in. thick; calyx-cavity broad and shallow, the lobes elongated, spreading or appressed, sometimes erect and incurved, often deciduous; flesh thick, bright yellow, dry and mealy; nutlets usually 2 or 3, occasionally 4, broadly ridged on the back, about ¼ in. long.

A broad bush often 15 feet in height with numerous thick stems standing erect and remote from one another at the top and thus forming an open broad head, and stout branchlets marked with oblong pale lenticels, bright chestnut-brown and lustrous during their first season, ashy gray during their second year, and armed with numerous spines, on some plants short and stout, on others elongated, more slender and straight or incurved. Flowers at the end of May. Fruit ripens from the 20th of September to the 10th of October and usually hangs on the branches until long after the leaves have fallen.

Rich hillsides and pastures, common from the Champlain Valley and Berkshire County, Massachusetts, to central and southern Massachusetts.

Easily distinguished from the other New England species of this group by the erect remote ends of the stems, by the thicker blue-green leaves pale on the lower surface, which hang down conspicuously on their slender petioles when the flowers are open.

C. pentandra. Leaves oval to ovate, acuminate, broadly cuneate or rarely rounded at the base, incisely divided above the middle into numerous short acute lobes, coarsely and often doubly glandular-serrate with spreading or incurved teeth, membranaceous, dark green and roughened above with short rigid pale hairs, pale and glabrous below, 2 to 2½ in. long, from 1½ to 2 in. wide, with slender midribs and thin primary veins running to the points of the lobes, or on vigorous shoots often from 3½ to 4 in. long and 3 in. wide; petioles slender, often slightly winged above, grooved, glandular with minute scattered dark glands, about 1 in. long. Flowers ⅔ in. in diameter in few-flowered compact glabrous thin-branched cymes; bracts and bractlets narrowly obovate to linear-lanceolate, obscurely glandular-serrate, light red; calyx obconic, glabrous, dark red, the lobes linear-lanceolate, entire and finely glandular-serrate, incurved after anthesis;

stamens 5, slender, incurved; anthers comparatively large; styles 3, surrounded by a thin tuft of hoary tomentum. Fruit oblong, full and rounded at the ends, dark crimson, lustrous, marked with minute pale lenticels, usually about $\frac{5}{8}$ in. long and $\frac{1}{2}$ in. thick, the calyx prominent and enlarged with elongated strongly incurved lobes persistent or sometimes deciduous; flesh yellow, thick, dry and mealy; nutlets 3, ridged on the back with a broad ridge $\frac{1}{3}$ in. long.

A tree 12 to 15 feet in height with a trunk 5 or 6 in. in diameter, stout branches forming a broad erect head irregular in outline, and slender glabrous branchlets marked with large pale lenticels, during their first season bright chestnut-brown, or in the case of vigorous shoots light orange-green, ashy gray in their second year, and armed with slender straight or incurved spines from 1 to $1\frac{1}{2}$ in. long. Flowers about May 20. Fruit ripens the middle of September.

VERMONT, Bennington, and West Rutland, *W. W. Eggleston*, May and September, 1899; Middlebury, Ferrisburg and West Rutland, *E. Brainerd*, August and September, 1900.

DILATATAE.

C. DILATATA, Sargent, Bot. Gazette, xxxi. 9 (1901). VERMONT, Ferrisburg and Middlebury, *E. Brainerd*, May and August, 1900.

PRUINOSAE.

C. PRUINOSA, Wendland. VERMONT, West Rutland, *W. W. Eggleston*, September, 1899, May, 1900; New Haven, *E. Brainerd*, June and October, 1900; near Burlington, *A. W. Edson*, June, 1900; NEW YORK, Crown Point, *Brainerd & Sargent*, September, 1900.

TOMENTOSAE.

C. MACRACANTHA, Lindley. VERMONT, near Burlington, *L. R. Jones*, October, 1899; Middlebury, *E. Brainerd*, September, 1900: NEW YORK, Crown Point, *Brainerd & Sargent*, September, 1900.

C. SUCCULENTA, Link. Common. VERMONT, Charlotte, *C. G. Pringle & F. H. Horsford*, June and September, 1879; Middlebury, Ferrisburg, New Haven, Waybridge, W. Rutland, *E. Brainerd*, 1900.

COCCINEAE.

C. COCCINEA var. ROTUNDIFOLIA, Sargent, Bot. Gazette, xxxi. 14 (1901). VERMONT, shores of Connecticut River, Lemington, *W. W. Eggleston*, August, 1899; Orwell, *W. W. Eggleston*, September,

1899; Fairhaven, *W. W. Eggleston*, May and June, 1900; Vergennes, *E. Brainerd*, August, 1900; Chimney Point, *E. Brainerd*, September, 1900; near Burlington, *A. W. Edson*, June, 1900: New York, Crown Point, *Brainerd & Sargent*, September, 1900.

C. praecox. Leaves rhomboidal, or on leading shoots nearly oval or ovate, acute, cuneate and decurrent at the base on the stout glandular petioles, divided above the middle into numerous short acute lobes, doubly serrate with broad glandular teeth except at the base, at the flowering time thin, yellow-green, coated above with short pale hairs, villose below on the slender midribs and thin primary veins arching to the points of the lobes; at maturity coriaceous, dark green, lustrous and scabrous above, paler and yellow-green below, from 1½ to 2 in. long and wide. Flowers in many-flowered broad loose villose cymes; bracts and bractlets linear-lanceolate to narrowly obovate, coarsely glandular-serrate, caducous; calyx narrowly obconic, densely coated with long white matted hairs, the lobes narrow, elongated, acute, glandular-serrate, nearly glabrous; stamens 10; filaments slender, elongated; anthers small, pale yellow; styles 3 to 5. Fruit subglobose, in pendulous villose clusters, dark crimson, somewhat hairy with scattered pale hairs especially at the ends, ⅔ in. in diameter; calyx cavity broad and shallow, the lobes acute, spreading, glandular-serrate, red on the upper side near the base, early deciduous; flesh yellow, thick, soft and pulpy; nutlets 5, ridged on the back with broad high rounded ridges, ¼ in. long.

A shrub 8 or 10 feet in height with numerous slender stems and zigzag lustrous orange-brown branchlets armed with numerous slender chestnut-brown spines 1½ to 2 in. long. Flowers at the end of May. Fruit ripens toward the end of August and falls early in September.

Vermont, Marsh Hill, Ferrisburg, *E. Brainerd*, August, 1900: New York, Crown Point, *Brainerd & Sargent*, September 9, 1900: Quebec, Caughnawaga, *J. G. Jack*, August, 1899, May and September, 1900.

This appears to be the *Crataegus glandulosa typica* of Regel, judging by plants in the Arnold Arboretum raised from seeds received under that name from the St. Petersburg Botanic Garden. Regel's varietal name *typica*, however, had been previously used by him in another species and thus cannot be taken up for this plant. *C. praecox* belongs to the Coccinea group and differs chiefly from the *C. coccinea* of Linnaeus, as I understand it, in its early-ripening fruit, the fruit of *C. coccinea* and of its variety *rotundifolia* being almost the latest of the Thorn Apples of New England to ripen and fall.

C. Brainerdi. Leaves ovate, acute or acuminate, cuneate or rounded and decurrent at the base on the slender grooved obscurely glandular petioles, slightly divided above the middle into numerous

short acute or acuminate lobes, coarsely and usually doubly serrate with glandular straight or incurved teeth, roughened above in early spring with short closely appressed pale hairs, at maturity thick and firm in texture, glabrous, dark green and lustrous on the upper surface, pale on the lower surface, 2¼ to 3 in. long, 1½ to 2 in. wide, with slender midribs slightly impressed above and thin primary veins running to the points of the lobes. Flowers ¾ in. in diameter in broad glabrous thin-branched compound many-flowered cymes; calyx narrowly obconic, the lobes linear-lanceolate, acuminate, slightly glandular-serrate, strongly reflexed after anthesis; stamens 20; filaments slender, elongated, usually persistent on the fruit; anthers small; styles 3, surrounded at the base by a narrow ring of hoary tomentum. Fruit erect on short stout peduncles, oblong, full and rounded at the ends, bright scarlet, ½ in. long, and ¼ to ⅓ in. thick; calyx cavity broad and deep, the lobes elongated, villous on the upper surface, irregularly glandular-serrate mostly above the middle, spreading or reflexed; flesh thick, light yellow, sweet and dry; nutlets 3, dark colored, conspicuously ridged on the back with a prominent thick rounded ridge, about ⅓ in. long.

A broad shrub occasionally 8 or 10 feet in height with slender glabrous branchlets bright chestnut-brown and lustrous during their first season, becoming ashy gray during their second year, and armed with stout usually curved spines rarely more than an inch and a half long. Flowers at the end of May. Fruit ripens late in September and early in October.

Roadsides near Middlebury, Vermont, rare and local, *E. Brainerd*, May and September, 1900.

In the form and texture of the leaves and in their winged glandular petioles, and in the character of the fruit, *C. Brainerdi* shows its relationship with *C. coccinea* of Linnaeus, but from all the other members of the Coccinea group which I have seen it differs in having 20 not 10 stamens.

Intricatae.

C. intricata, Lange. Vermont, only on rocky benches of Twin Mountain, West Rutland, *W. W. Eggleston*, June and October, 1900.

C. modesta Leaves ovate, acute, cuneate, rounded or on leading shoots truncate or slightly cordate and abruptly narrowed at the base, divided into numerous short broad acute lobes, occasionally appearing 3-lobed by the greater development of the lowest pair, sharply doubly serrate with minute glandular spreading teeth, in early spring bronze color, hirsute above with short white hairs and villose below, at maturity thick and firm in texture, dark yellow-green and scabrous on the upper surface, pale and pubescent below along the slender often light-red midribs and 2 or 3 pairs of prominent veins, or sca

brous over the lower surface of the leaves of vigorous shoots, from 1½ to 2 in. long and from 1 to 1¼ in. wide; petioles more or less winged above, villose, glandular, often red, from ½ to ⅝ in. long. Flowers nearly 1 in. in diameter on short stout pedicels in compact 3- to 6-flowered villose corymbs; bracts and bractlets lanceolate, conspicuously glandular-serrate with stipitate large dark glands; calyx broadly obconic, villose, the lobes lanceolate, glandular-serrate, coated with matted pale hairs; stamens 10; filaments short and stout; anthers large, pale yellow; styles 3, surrounded at the base by tufts of matted white hairs. Fruit erect on short villose peduncles, subglobose and flattened at the ends, or rarely oblong or pear-shaped, about ½ in. long, green, bright yellow or orange with a red cheek, marked with numerous large dark spots; calyx high and prominent with a broad deep cavity, the lobes small, linear-lanceolate, glandular-serrate, spreading, mostly deciduous; flesh thick, light yellow, sweet, dry and mealy, nutlets 3, broad, conspicuously ridged on the back with broad thick ridges, ¼ in. long.

A shrub with numerous much-branched slender stems 1 to 3 feet in height, bright chestnut-brown and lustrous during their first season, later becoming dull gray-brown, and armed with thin straight spines ¾ to 1½ in. long. Flowers during the first week of June. Fruit ripens toward the end of September.

Found only on dry rocky benches of Twin Mountain, West Rutland, Vermont, growing with *C. intricata*, Lange, *W. W. Eggleston*, May 31, 1899, *Brainerd & Eggleston*, September, 1899, *Eggleston & Sargent*, June 2, 1900.

Anomalae.

C. scabrida. Leaves oval to obovate, acuminate, gradually narrowed from near the middle to the cuneate base, divided above into numerous short spreading lobes, irregularly glandular-dentate nearly to the base, with slender midribs deeply impressed above and thin veins running to the points of the lobes, coated above at the flowering time with short soft pale hairs, at maturity thick and firm, dark green and scabrate on the upper surface, pale yellow-green and glabrous on the lower surface, 2 to 3 in. long and from 1½ to 2 in. wide; petioles slender, occasionally glandular, often slightly winged above, ½ to 1¼ in. long. Flowers ¾ in. in diameter, in loose broad thin-branched glabrous cymes; calyx narrowly obconnate, glabrous, the lobes linear-lanceolate, long-pointed, finely glandular-serrate, reflexed and bright red at the tips after anthesis; stamens 5 to 15; filaments slender, elongated; anthers small, pale yellow; styles 3, surrounded by a thick tuft of pale tomentum. Fruit in loose drooping clusters, subglobose, scarlet ½ in. in diameter; calyx cavity broad and shallow, usually only the bases of the elongated reflexed lobes

persistent at maturity; flesh yellow, thick, dry and mealy; nutlets 3, thick, rounded and prominently ridged on the back ⅓ in. long.

An intricately branched tree 15 to 20 feet in height with a trunk 6 or 8 in. in diameter, spreading horizontal branches forming a broad round-topped head, or often shrubby, and stout, slightly zigzag glabrous branchlets marked with oblong pale lenticels, dark chestnut-brown during their first season, becoming ashy gray during their second year, and armed with slender straight or curved spines from 1½ to 2 in. in length. Flowers at the end of May. Fruit ripens from the middle to the end of September.

Vermont, Bennington and West Rutland, *W. W. Eggleston*, September 8, 1899, and May and September, 1900; Middlebury and New Haven, *E. Brainerd*, 1900: New Hampshire, Troy, *E. L. Rand & B. L. Robinson* (no. 674), September 23, 1899.

C. Egglestoni. Leaves oval or on leading shoots often nearly orbicular, acute, rounded or cuneate at the broad base, slightly divided above the middle into numerous short acute lobes, coarsely doubly serrate with glandular teeth, dark yellow-green and roughened above with short persistent pale hairs, pale and glabrous below, about 2 in. long and 1½ to 2 in. wide, with slender midribs and primary veins only slightly impressed above; petioles slender, deeply grooved, glandular with small scattered dark glands, more or less winged at the apex, reddish brown toward the base, ¾ in. long. Flowers ⅝ in. in diameter, in crowded compound many-flowered cymes, the slender branches and petioles covered with scattered long white soft deciduous hairs; calyx-tube obconic, glabrous, the lobes narrow, acute, glandular-serrate with minute dark red glands, villose on the upper surface, reflexed after anthesis; stamens usually 5, occasionally 7 or 8; filaments slender, elongated; anthers small, pale rose-color; styles 2 or 3. Fruit pendant in many-fruited clusters, oblong, full and rounded at the ends, orange-color at first when fully grown, at maturity bright crimson, lustrous, marked with occasional large pale dots, ½ in. long; calyx cavity deep and narrow, the lobes entire or slightly dentate above the middle, appressed; flesh thick, yellow, sweet, dry and mealy; nutlets 2 or 3, more or less prominently ridged on back, ¼ in. long.

A wide many-stemmed much-branched shrub occasionally fifteen feet in height, with slender somewhat zigzag lustrous branchlets marked with large pale oblong lenticels, orange-green during their first season, pale orange-color during their second year, and finally dark red-brown, and armed with numerous straight lustrous spines usually ½ in. in length.

Flowers during the first week in June. Fruit ripens late in September and hangs on the branches until long after the leaves have fallen.

Vermont, open grassy slopes of Bald Mountain, Shrewsbury, *W. W. Eggleston*, October, 1899, *Eggleston & Sargent*, June, 1900,

Brainerd & Sargent, September, 1900, St. Albans, *E. Brainerd*, September, 1900.

C. asperifolia. Leaves oval, acute or acuminate, cuneate or on leading shoots rounded at the base, slightly divided above the middle into numerous short acute lobes, coarsely and doubly serrate with glandular teeth, mostly entire toward the base, thick and firm in texture, dark green, lustrous and roughened above with short pale persistent hairs, pale and glabrous below, 2½ to 3 in. long, 2 to 2½ in. wide, with thin midribs slightly impressed above and slender primary veins arching to the points of the lobes; petioles slender, somewhat winged at the apex, often red below the middle, ¾ to 1 in. in length. Flowers ¾ in. in diameter, in broad many-flowered thin-branched glabrous cymes; bracts and bractlets linear, glandular-serrate; calyx-tube narrowly obconic, glabrous, the lobes lanceolate from broad bases, elongated, acute, glabrous, obscurely glandular-serrate especially below the middle, often bright red toward the apex; stamens 10; filaments stout, elongated; anthers large; styles 3 or 4, surrounded at the base by small tufts of pale hairs. Fruit drooping in few-fruited open clusters, oblong, bright scarlet, ½ in. long, ⅓ in. thick; calyx cavity deep and narrow, the lobes elongated, appressed, bright red on the upper surface toward the base; flesh yellow, thick, dry and mealy; nutlets usually 4, light-colored, rounded and sometimes obscurely grooved on the back, ¼ in. long.

A shrub 5 or 6 feet in height with stout glabrous dull chestnut-brown branchlets marked with oblong pale lenticels, becoming ashy gray during their second season, and armed with slender nearly straight spines from 1½ to 2 in. in length.

Flowers at the end of May. Fruit ripens about the first of October.

Vermont, Middlebury and New Haven, *E. Brainerd*, May and September, 1900.

Arnold Arboretum.

SCIRPUS ATRATUS A SYNONYM OF SCIRPUS PECKII.

Ezra Brainerd.

Scirpus Peckii, Britton, (Trans. N. Y. Acad. Sci. XI: 82, 1892,) was based upon specimens collected by Professor Peck in the Adirondack region of New York and upon specimens from Connecticut. Dr. Britton considered both these collections as representing *Scirpus polyphyllus*, var. *macrostachys*, Boeckeler, which he thought worthy of specific rank; and as the name "macrostachyus" had been used before in the genus, he called the new species *Scirpus Peckii*.

On looking at these type specimens last March with Dr. Britton, I was surprised to note that Prof. Peck's plants did not seem to differ from the *Scirpus atratus* of Mr. Fernald, published in Rhodora II: 18, 1900. A careful comparison of further material of the Adirondack collection, kindly given me by Prof. Peck, with type specimens of Mr. Fernald's proved beyond doubt their identity. At the same time it appeared that they were quite distinct from the Connecticut plant. The spikelets of the latter are brown, of the former blackish; the achenes of the latter are much larger than those of the former; the bristles of the latter are comparatively short, and closely barbed, those of the former are over twice the length of the achene, and with scattered barbs. Dr. Britton, then, it seems, had before him in the material on which *S. Peckii* was founded two distinct things, probably of distinct geographical range: (1) the blackish plant of the northern mountains, represented by Professor Peck's collection from the Adirondacks, to which the name *S. Peckii* must be restricted; and (2) the ferruginous plant of southern New England and southward, which Boeckeler, as it seems to us, correctly disposed of as a long-spiked variety of *Scirpus polyphyllus*, Vahl. In the cut of *Scirpus Peckii* in the Illustrated Flora (fig. 633), while the umbel and spikelet are from the Adirondack plant, the achene with its bristles is apparently from the Connecticut plant (compare with the achene in fig. 632). A specimen of the Connecticut plant in the Gray Herbarium was named *S. Peckii* by Dr. Britton; and naturally Mr. Fernald on seeing specimens of the other species from Vermont and New Hampshire failed to recognize it as *S. Peckii*, and published it as *S. atratus*.

A few additional facts regarding this beautiful species — the true *Scirpus Peckii*, Britton — may be of interest. According to Rhodora II: 17, Mr. Edwin Faxon is supposed to have first discovered it at Sutton, Vermont, in 1881. But Professor Jesup of Dartmouth College collected it in the vicinity of Hanover, N. H., Aug. 21, 1878. Soon after he sent me a specimen, querying if it was *S. Eriophorum* long gone to seed, and remarking that it looked odd. For several summers I was on the lookout for something to match it, but collected only forms of what Mr. Fernald has since distinguished as *Scirpus atrocinctus*. It was not until July 17, 1898, that I found a single plant of *S. Peckii* on the border of a peat-bog in the Green Mountains at an altitude of 1300 ft. This was sent unnamed to the Gray

Herbarium, and together with Mr. Faxon's plant and specimens collected by Mr. Fernald in New Hampshire in 1899 formed the original material of *S. atratus*.

The past summer I spent several days searching for further specimens in the mountains of Vermont. In a drive of over seventy miles I found single plants of two or three culms each in six stations miles apart. At last, however, at a lower altitude of about 500 feet it was seen in abundance in a moist meadow of coarse alluvium brought down by a mountain brook. Afterward in August I found it plentifully in the upland meadows of Wallingford in Rutland County. It is not a plant of bogs or wet places, like *S. cyperinus*, *S. atrocinctus*, and *S. rubrotinctus;* but affects a moist, heavy soil. The fruit begins to ripen and to drop by the middle of July, while the tips of the spikelets are still in flower. It is surely a welcome addition to the mountain flora of New York and New England, in spite of the misfortunes that have attended its christening.

Middlebury College.

NOTES ON THE FLORA OF RHODE ISLAND.

Wm. Whitman Bailey.

Mr. Joseph W. Congdon, for many years the leading systematic botanist in Rhode Island, and now residing at Mariposa, California, sends me interesting notes elicited by my recent article in Rhodora. The localities of which I did not know the present names have been explained by him and others; thus "Tifft's" or Teft's Woods" were on Federal Hill, near the present Atwell's Avenue; "Triptown" is now our suburb, Manton; while "Tar-kiln" is a station on the Pascoag Railroad. Mr. Congdon writes: —

"Years ago *Utricularia purpurea* belonged to Little Benedict Pond, while around the borders grew *Coreopsis rosea*, *Fuirena*, *Hemicarpha*, etc. I presume your Pawtucket locality is either Spectacle Pond, back of the old Lindsay Tavern, or another pond on the southerly side of the turn-pike, about half a mile distant. The *Eupatorium hyssopifolium* (also *aromaticum*) indicate Spectacle Pond, the sole Rhode Island habitat for *Psilocarya*. *Carex Olneyi*, I was long ago satisfied, is nothing but a bybrid of *C. utriculata* with probably *C. monile*. Its ovaries were uniformly abortive. I dis-

cussed the matter once with Olney, himself, and he was more than half inclined to agree with me.

Drosera longifolia, as we called it then, grew in Olneyville swamp and in the swamps between that village and the head of the cove. I suppose by this time the old swamp is all filled up. It was a great locality. *Carex exilis*, *C. teretiuscula*, *Epilobium molle* (so we termed it then), and many other things belonged there. I believe I gathered the last specimens of Linnaea at Mr. Olney's locality. When last I visited the spot the plant had been all 'improved' away. It grew in Connecticut ten miles west of the Rhode Island line in just one spot. It may, however, easily occur in Fiskeville or Burrillville."

[The one and only Linnaea locality was quite near the then sadly neglected grave of Esek. Hopkins, first commander of the American Navy. — W. W. B.]

"With regard to the orchids, Bigelow's *Habenaria fimbriata* is now *H. psycodes* and his *psycodes* the modern *lacera*, while he makes what is now *fimbriata*, *grandiflora*. So also his *Corallorhiza odontorhiza* is, I am satisfied, *C. multiflora*, Nutt., which is twenty times more common in New England. In fact, I never saw *C. odontorhiza* in Rhode Island but once, in Warwick. In after years the same locality was entirely barren. Bigelow's *Myriophyllum procumbens* is the half terrestrial form of *M. ambiguum*, Nutt., and to be found (in my day) in both forms at Little Benedict Pond. *Lygodium* I never saw growing except at Quinsnickett, Smithfield, where it was introduced. There is another locality in Burrillville."

[My own locality, in South Scituate, was, when I last visited it, about 1880, a fine one. The copse near the water was full of it. — W. W. B.]

"I wonder whether the old salt marsh where Olney first found *Scirpus Olneyi*, still remains. Even in my time they had put a road through leaving the original patch upon one side. It is far from uncommon in California."

Brown University.

Baptisia tinctoria as a Tumble-weed.— Referring to Dr. Beal's list of "Tumble-weeds" I may say that a number of years ago I found *Baptisia tinctoria* (L.) R. Br. growing as a tumble-weed on

Martha's Vineyard, Massachusetts. It assumed a nearly spherical form late in the season, and early in the winter broke away just at the ground with an almost circular fracture. It rolled over the Vineyard hills in a manner quite like that of the tumble-weeds of the Great Plains.— CHARLES E. BESSEY, University of Nebraska.

TWO ERODIUMS AT TEWKSBURY, MASSACHUSETTS. — It is not often that the collector, who has botanized for many years, in the country about his home, is afforded the keen pleasure of meeting with a species new to his experience. It was, therefore, an unmixed delight for me, to discover in a neglected field at Tewksbury, Massachusetts, two species of *Erodium* which proved on examination to be *E. cicutarium*, L' Her., and *E. Botrys*, Bertol. Notwithstanding the lateness of the season (Nov. 4, 1900) which gave an additional zest to the pleasure of discovery, both species bore abundant flowers and fruit and the foliage was fresh and green.

Erodium cicutarium is given in most of our manuals and local floras as of occasional occurrence, but *E. Botrys* is mentioned for this region only in the Flora of Middlesex County, where the only locality given is "Westford, Woolen-Mill Yard (Dr. C. W. Swan). A native of South Europe but introduced in California wool."

Wishing to secure additional material, as I found that but few of my botanical friends had collected these plants, I visited the locality again a week later, in company with other enthusiastic collectors. Although a severe frost had occurred in the interim, we again found the plants in excellent condition and without difficulty traced their origin to many tufts of wool-waste which remained on the field here and there. While we were carefully examining the acre of land where these plants grew, the owner of the farm strolled up to us, wondering no doubt what kind of treasure or what form of insanity could induce four respectable looking city men to wander up and down his old turnip patch, digging up now and then a weed and clapping it into a tin box. On inquiry from him we learned that the field had been dressed some years before with wool-waste, from the Stirling Mills at Lowell. This seems to be the form of conveyance selected by Erodium, therefore when you meet one of the species, do not conclude it is native, but look for wool-waste.—EMILE F. WILLIAMS, Boston, Massachusetts.

Botrychium matricariaefolium in Connecticut.— On July 4th, 1896, several specimens of *Botrychium matricariaefolium*, Braun, were collected in West Hartford, Connecticut, near the summit of the Talcott Range. Of the discovery no special record was made, as the plant was not known to be uncommon in the State. A single specimen in my herbarium and one in that of Mr. C. A. Weatherby, who was collecting with me at the time are the only ones preserved from this station. One of these, sent to Mr. Merritt L. Fernald of the Gray Herbarium for identification was verified as "good *Botrychium matricariaefolium*." In the issue of Rhodora for June, 1900, this plant is reported from Southbridge, Massachusetts, that being the most southern station known in New England. The discovery of the Talcott Mountain station (altitude about 650 feet) not only extends the range some few miles southward but adds a new and desirable plant to the flora of Connecticut.— A. W. Driggs, East Hartford, Connecticut.

Extended ranges in Cyperus and Hieracium. — *Cyperus microdontus*, Torr. (*C. polystachyus*, Rottb. var. *leptostachyus*, Boeckl., Gray's Man. 6th Edit.), given in our manuals as "Virginia to Florida and Texas," was collected Sept. 2d, 1900, by the writer on the shore of Clay Pit Creek near Navesink, Monmouth Co., New Jersey.

Hieracium vulgatum, Fries, reported in Britton & Brown's Illustrated Flora as "Labrador and Newfoundland to Quebec and in southern New York and New Jersey. Probably introduced. Also in Greenland, Northern Europe and Asia," was found on July 28th, 1900, by J. Franklin Collins and the writer, growing in abundance along the shores of the Allagash river, near its confluence with the St. John river, Aroostook County, Maine. This was the typical form and it appears to be its first discovery in New England. Mr. M. L. Fernald has already reported the appearance of *H. vulgatum*, var. *irriguum*, Fries, which he discovered on the cliffs of the Penobscot river and its tributaries.

Hieracium pratense, Tausch, given in Britton & Brown's Illustrated Flora as "Dongan Hills Staten Island, N. Y." was found on July 19, 1900, by J. Franklin Collins and the writer at Van Buren, Aroostook County, Maine. It was growing along the railway near the station.

This is believed to be the first report of its occurrence in New England. — EMILE F. WILLIAMS, Boston, Massachusetts.

[Studies of American Fungi. Mushrooms Edible, Poisonous, etc. By George Francis Atkinson, Professor of Botany in Cornell University; Ithaca, N. Y., Andrus and Church, 1900; 275 pages, 200 illustrations from photographs, besides colored plates and other figures. $3.00.]

MR. ATKINSON'S book makes immediately a favorable impression by the number and excellence of its illustrations. They are from photographs taken by the author and represent over one hundred and fifty species as they actually look in nature — lacking, of course, the color. To color, however, it must be said, a beginner is prone to give much too great importance, not having any experience with its variability in these plants. Thus it is no real disadvantage to the student to be forced to attend to details of texture and structure, such as the camera can faithfully record. Particularly is this true in the first steps of study, when attention must be paid to characteristics by which genera are discriminated, for in the acquirement of facility to distinguish one genus from another, color, except that of the spores, plays a small part. It is one of the objects of the author, as he states in his introduction, to present typical forms of nearly all of the genera of the gilled mushrooms, and he has succeeded admirably. His material is well chosen, and there is abundance of it, some common species, such as *Agaricus campestris*, *Amanita phalloides*, *A. muscaria*, and *Coprinus comatus*, being shown at different stages of development and in a variety of aspects. The few colored plates attempted are on the whole acceptable, but we can be glad that they are not more numerous.

It is evident, however, from a study of Mr. Atkinson's plates, as it has been from the photographs of Mr. Lloyd of Cincinnati, that the camera can be relied on for more than generic distinctions. Except in a small percentage of cases a good photograph will preserve even the individuality of a species. To attain this object, care and skill must be shown in the collection and arrangement of material, as in Mr. Atkinson's work. With such photographs, for instance, as those of *Hydnum coralloides*, *H. erinaceus*, and *H. caput-ursi*, in the hands of amateurs, we may hope that the reports of finding *H. caput-Medusae* will become much less frequent.

There is strong inclination, then, to speak only in praise of Mr.

Atkinson's illustrations. If fault were to be found at all, it would be with figures 85 (*Armillaria mellea*), 123 (*Cantharellus cibarius*), and 201 (*Dictyophora duplicata*), which certainly do not adequately present these species.

The descriptive part of the text is much more than a running accompaniment to the illustrations. Most of the descriptions are from actual observations of the author, and are not mere copies of the stingy, technical diagnoses of ordinary systematic works. Besides ample notes of color, structure, variability, habitat, etc. are frequently appended details of microscopic structure. It must be said, however, that comparison of related species would be facilitated by greater fullness in some cases. Why, for example, may we not have the spore-measurements of *Amanita phalloides* to compare with those of *A. floccocephala*? To be sure the measurements of other observers can easily be referred to, but we want to compare Mr. Atkinson with Mr. Atkinson.

Besides the systematic part of the book, which forms the bulk of the volume, there are introductory chapters on structure and development, copiously illustrated, the substance of which has already appeared in the Bulletins of the Cornell University Agricultural Experiment Station. There are also chapters on "The Collection and Preservation of the Fleshy Fungi," on the "Selection and Preservation of Mushrooms for the Table," on "Recipes for Cooking Mushrooms" (by Mrs. Sarah Tyson Rorer), on the "Chemistry and Toxicology of the Fungi" (by J. F. Clark), and on "Structural Characters" (by H. Hasselbring), all of which are admirable in their way and increase the value of the book to people at large.

In spite of its good qualities, the book as a whole somehow lacks symmetry and unity. It is not aimed at any one class of readers. In the main intended for popular use it yet contains, perhaps to the surprise of some botanists, descriptions of several proposed new species, though the first medium at hand has often enough before been utilized for such a purpose. Ordinary readers, too, can hardly be interested in illustrations of such species as *Boletus obsonium*, *Pleurotus sulphuroides*, and *Armillaria aurantia*, especially when they will search the pages in vain for many of the commonest species which awaken prompt inquiry, the moment the eager mushroom hunter gets his eyes open. Scant mention of species, such as often occurs, as on pages 48 (*Panæolus fimicola*, etc.) 90 (*Clitocybe cyathi-*

formis) 152 (*Pholiota aurivella*), and elsewhere, is of no possible use in such a book. It gives no information to anybody. A puzzle in synonymy is offered to inexperienced readers on pages 16 and 17, where the bewildering nature of the "ambiguous trametes" is exemplified by treating it as *Trametes* in the text, and as *Daedalea* in the accompanying figure — all without a word of explanation. This is the more remarkable in view of the absence of any treatment (other than this brief obscure mention of a single species) of the common genera *Trametes*, *Daedalea*, and *Lenzites*, and is one of the many indications that might be cited that the book has been hurried to publication before all the matter that properly belongs in such a popular exposition of the more important genera was assembled.

To insist on the absence of a definite plan in the book, other than that of getting a certain amount of available material between two covers and thus catching the market, would perhaps be unjust in view of what is told us in the introduction, where the author says:

"Since the issue of my 'Studies and Illustrations of Mushrooms,' .... there have been so many inquiries for them and for literature dealing with a larger number of species, it seemed desirable to publish in book form a selection from the number of illustrations of these plants which I have accumulated during the past six or seven years."

Yet, by the author's own admission, the contents of the book are to some extent the result of accident. In this respect the book compares unfavorably with Cooke's well known "British Edible Fungi," which selects a few conspicuous species, or even with Mr. McIlvaine's tome, which attempts to include all American fungi known to be edible.

Passing from general considerations to the criticism of certain details, such as the spelling of generic and specific names, we find too many examples of unscholarly oversight and error. Some instances of carelessness in the proof reading are conspicuous, as ENTOMOLA p. 143, and again on p. 144; fuligineus, hygrophanus (as English words) p. 266. Other errors can hardly be set down to the same cause, particularly when the inaccuracies of the text are accurately reproduced in the legends of the plates and in the index. The following may be cited: *Amanita caesaria* (caesarea), p. iv, and pl. 19; *Hebeloma crustinuliforme* (—tulin—), p. 158 and fig. 148; *Pluteus tomentosulsus* (—ulus) p. 139, 140; *Boletus luridis* (— us), p.

249 (three times); *Annelaria* (Anellaria) p. 265. And furthermore what is to be thought of the following?—*Tricholoma aurantia*, p. 86, *Calostoma cinnabarina*, p. 212, 213, and pl. 72. Yet we find the author on page 168 holding up his hands (if that be the interpretation of his exclamation point) at Mr. Lloyd's "*Flammula rhodoxanthus*!"

Of minor importance, yet perhaps worth a comment, is the inconsistency shown in retaining Vittadini's original spelling *rachodes* (in *Lepiota rhacodes*) while changing Fries's *pargamenus* (in *Poiystictus pergamenns*). Is it not better to spell *rhacodes* correctly?

Nine "new species" are described and illustrated: *Amanita floccocephala*, *A. velatipes*, *A. cothurnata*, *Lepiota asperula*, *Mycena cyanothrix*, *Hypholoma rugocephalum*, *Bolbitius variicolor*, *Paxillus corrugatus*, and *Hydnum putidum*. Of certain of these a fuller discussion would be welcome. *Amanita floccocephala*, for instance, does not stand out clearly from *A. phalloides*; *A. cothurnata*, suggests Peck's *A. crenulata*, both in description and figures; *Mycena cyanothrix* seems too close to *M. cyaneobasis* Peck, which is admittedly near *M. calorhiza* Bres. a species identified by some with *M. Iris* Berk.; yet there is nothing to show that the older species were studied in connection with the forms proposed as new.

To the great and increasing number of people who want information about our mushrooms Mr. Atkinson's "Studies" will be as helpful as any single book obtainable. It is certainly the best collection yet published of illustrations of our species.

The long expected Flora of Vermont[1] by Messrs. E. Brainerd, L. R. Jones, and W. W. Eggleston has just been issued. It covers the ferns and seed-plants of the State and bears evidence of great care in its preparation, indeed it is probable that no local flora has been compiled with more conscientious effort to present in well-judged form the results of recent segregation among American flowering plants. The editors have wisely chosen a conservative course in nomenclature. This welcome addition to the literature of New England botany is gracefully and appropriately dedicated to New England's veteran collector, Cyrus Guernsey Pringle.

[1] Contrib. to Bot. of Vermont viii, extracted from the 20th Vermont Agric. Report, 8vo. 113 pp.

Vol. 3, No. 25, including pages 1 to 18 and plate 22, was issued January 2, 1901.

BOTANICAL PUBLICATIONS

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